THE SOIL MOISTURE ACTIVE PASSIVE EXPERIMENTS: TOWARDS ACTIVE PASSIVE RETRIEVAL AND DOWNSCALING

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NASA's Soil Moisture Active Passive (SMAP) mission is scheduled for launch in 2014. This soil moisture dedicated mission will carry a combined L-band radar and radiometer system with the objective of mapping near surface soil moisture globally at an unprecedented spatial resolution. The scientific rationale for SMAP is an improved accuracy and spatial resolution of soil moisture estimates through the combination of high resolution (3 km) but noisy radar derived soil moisture information and the more accurate yet lower resolution (36 km) radiometer derived soil moisture information, yielding a 9 km active-passive soil moisture product. In order to achieve these objectives, algorithms need to be developed and tested using airborne data that simulate the radar and radiometer observations that SMAP will provide. The Soil Moisture Active Passive Experiment (SMAPEx) is a series of three airborne field campaigns contributing to the development and validation of such algorithms, providing prototype SMAP observations collected with a unique active and passive airborne facility over a heavily monitored study area in south-eastern Australia. This paper outlines the airborne and ground sampling rationale, the progress towards producing simulated active-passive SMAP data sets for a range of soil moisture and vegetation conditions, including a single 3-week long dry-down period during the spring growing season, and the development of 1 km resolution passive only soil moisture maps for validation of active-passive retrieval and downscaling studies.